

REMARKS

Claims 1-10 are pending in the application and stand rejected. Reconsideration and allowance of Claims 1-10 in view of the following remarks is respectfully requested.

Rejection of Claims 1-10 under 35 U.S.C. §103(a)

Claims 1-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP 1202365, issued to Yamaguchi et al. (Yamaguchi) in view of U.S. Patent No. 6,565,763, issued to Asakawa et al. (Asakawa). Withdrawal of the rejection is respectfully requested for the following reasons.

Claim 1 relates to an electrolyte membrane having a porous substrate with the following characteristics:

(a) a porous substrate having pores that are filled with a first polymer having proton conductivity that imparts proton conductivity to the electrolyte membrane, and

(b) a porous substrate comprised of

(i) a second polymer that is a crosslinked polyolefin, and

(ii) a third polymer having a double bond.

Claims 2-10 depend from Claim 1.

The Yamaguchi reference fails to disclose a crosslinked polyolefin (second polymer) as required in the claimed invention.

The Yamaguchi reference does not teach a crosslinked polyolefin. The Yamaguchi reference discloses that the substrate of the membrane includes Teflon and polyimide. However, nowhere does the reference disclose a substrate that includes a crosslinked polyolefin.

The Asakawa reference does not teach a crosslinked polyolefin **and** a double bond containing polymer simultaneously.

First, the Asakawa reference does not teach a crosslinked polyolefin in the porous substrate as required by the claimed invention. The Asakawa reference discloses a material

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made of a block copolymer or a graft copolymer. Those copolymers have two components: a decomposable polymer component and an indecomposable polymer component. According to Asakawa, the decomposable polymer may be polypropylene, polyisobutylene, and poly(α -methylstyrene) (Column 13, lines 59-54). Further, the reference discloses the following candidates for the indecomposable polymer: (1) polymers having a hydrogen atom at the α -position of the polymer chain, such as polyethylene, polystyrene, polyacrylic acid, polymethyl acrylate, polyacrylamide, and polymethyl vinyl ketone; (2) polymers having a double bond, such as 1,2-dibutadiene, which can be crosslinked by the energy beam, and (3) derivatives of polynorbornene and polycyclohexane (Column 14, lines 13-21). In the practice of the reference, the double-bond containing polymer, or the derivatives of polynorbornene, is crosslinked by the energy beam or heat to form a crosslinked indecomposable polymer. However, this crosslinked indecomposable polymer is not a crosslinked polyolefin, as required in the claimed invention. In fact, Asakawa fails to disclose a crosslinked polyolefin anywhere in the reference.

Second, Asakawa's porous material contains only one polymer. Before heating or irradiation, Asakawa's material contains a copolymer with two components: the decomposable block and the indecomposable block. After removal of the decomposable block, the material still only contains one polymer, the indecomposable polymer. This indecomposable polymer could be a polymer having a hydrogen atom at the α -position, a crosslinked polybutadiene, or a crosslinked polynorbornene. Therefore, in contrast to the claimed invention, which requires two different types of polymers in the membrane substrate, the Asakawa reference does not teach a membrane substrate simultaneously having a crosslinked polyolefin **and** a double bond containing polymer.

The combination of the teachings in the Yamaguchi reference and the Asakawa reference does not lead to the claimed invention.

As noted above, neither the Yamaguchi reference nor the Asakawa reference teaches a crosslinked polyolefin in the membrane substrate. Therefore, even if one combines the teachings in the two cited references, one still would not achieve the claimed invention, i.e., a membrane with a substrate comprising a crosslinked polyolefin and a double bond containing polymer.

Because the cited references do not teach or suggest the claimed invention, the claimed invention is nonobvious and patentable over the cited references. Withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of foregoing remarks, applicants believe that Claims 1-10 are in condition for allowance. If any issue remains that may be expeditiously addressed in a telephone interview, the Examiner is encouraged to telephone applicants' attorney at the number listed below.

Respectfully submitted,

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